56

THE MENTAL ACCOUNTANT.

CONTAINING

RULES

FOR PERFORMING THE COMPUTATIONS, WHICH USUALLY OCCUR IN BUSINESS,

WITHOUT A PEN.

INTENDED CHIEFLY

For the Higher Claſſes of YOUNG GENTLEMEN at Boarding Schools and Academies;

AND FOR YOUNG MERCHANTS.

By THOMAS WHITING,

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AND

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PREFACE.

THE reader or ſtudent of any work, eſpecially of ſcience, muſt in ſome degree, co-operate with the author; otherwiſe every effort to ſerve him will be ineffectual. In the preſent caſe he muſt chearfully make himſelf thoroughly maſter of the three tables. For the labour and time employed for that purpoſe, he will be moſt amply rewarded. It is by a familiar

miliar acquaintance with theſe tables, that the rules are performed, which are contained in this treatiſe.

There has never been any attempt of this kind made before. The reaſon probably is, that it has been thought impracticable. I have, however, long entertained an opinion of a very different kind; being convinced, that ſuch acuteneſs and expedition is attainable in accounts, that almoſt every computation, relative to the value of any quantity of goods, may be inſtantly performed without a pen, or any ſubſtitute for it. This is the idea on which this treatiſe is offered to the public; and it is hoped that even a tranſient

tranſient reading of it will juſtify the idea.

The enlarged multiplication table will be got off, by thoſe who are advanced in arithmetic, in leſs time than they formerly employed on the common one. The ſame may be ſaid of the pence table. When they are once properly fixed, they will no more eſcape the memory than the common ones.

By reading the rules, and applying them to the examples, they will become familiar, and as they are ſelf-evident, will be no manner of burden to the memory. It will be neceſſary to be capable of inſtantly dividing two or three figures, as 78, 216, 265, by any ſmall diviſor, eſpecially 2 or 4. This may eaſily be attained by a little practice.

If young gentlemen in Boarding-ſchools and Academies, who are intended for commerce, be furniſhed with this treatiſe a month or two before their leaving ſchool, they will, undoubtedly, on entering into a counting-houſe, have a vaſt ſuperiority over ſuch as never attempted any conſiderable calculation without a pen.

To youth, who have already entered into a commercial line, this book is alſo reſpectfully offered.

The

The great advantage of this expeditious mode of computation, and the uncommon ſatisfaction which conciſeneſs in accounts gives to the mind, will, I humbly venture to hope, make it, when known, generally adopted and encouraged.

T. WHITING.

LAMBETH,
January 1ſt, 1788.

* * *

ADVER-

ADVERTISEMENT.

Young Gentlemen are boarded, and expeditiouſly taught, near Weſtminſter-Bridge, Lambeth, Engliſh, Writing, Arithmetic, Book-keeping, Geometry, Trigonometry, Menſuration, Navigation, Longitude by Obſervation, Algebra, Fluxions, Aſtronomy, &c.

BY

The AUTHOR and ASSISTANTS.

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CHA-

CHARACTERS uſed in this Book.

= Equal.

+ Add, thus, 6*l.* 12*l.*+9*s.* 5*d.*=7*l.* 1*s.* 5*d.*

− Subtract, as 8*l.* 1*s.*−17*s.* 8*d.*=7*l.* 3*s.* 4*d.*

× Multiply, thus, 4*l.* 2*s.* 7*d.*×3=12*l.* 7*s.* 9*d.*

÷ Divide, as 8*l.* 7*s.* 3*d.*÷2=4*l.* 3*s.* $7\frac{1}{2}$.

3..15::8..40, ſignifies, as 3 is to 15, ſo is 8 to 40.

One number is ſaid to be a multiple of another, when the former can be divided by the latter, without a remainder: thus 24 is a multiple of 6, for 24 can be divided by 6 without a remainder.

Again, 156 is a multiple of 12; for it can be divided by 12, and there is no remainder.

THE

THE

MENTAL ACCOUNTANT.

SECTION I.

The neceſſary Tables, and their Explanation.

TABLE I.

AN ENLARGED MULTIPLICATION.

1	13	14	15	16	17	18	19
2	26	28	30	32	34	36	38
3	39	42	45	48	51	54	57
4	52	56	60	64	68	72	76
5	65	70	75	80	85	90	95
6	78	84	90	96	102	108	114
7	91	98	105	112	119	126	133
8	104	112	120	128	136	144	152
9	117	126	135	144	153	162	171
10	130	140	150	160	170	180	190
11	143	154	165	176	187	198	209
12	156	168	180	192	204	216	228

TABLE II.

AN ENLARGED PENCE TABLE.

D.	*S.*	*D.*	*D.*	*L.*	*S.*	*D.*
150	12	6	228	0	19	0
156	13	0	230	0	19	2
160	13	4	240	1	0	0
168	14	0	252	1	1	0
170	14	2	300	1	5	0
180	15	0	400	1	13	4
190	15	10	500	2	1	8
192	16	0	600	2	10	0
200	16	8	700	2	18	4
204	17	0	800	3	6	8
210	17	6	900	3	15	0
216	18	0	960	4	0	0
220	18	4	1000	4	3	4

TABLE III.

ALIQUOT PARTS OF A GUINEA.

S.	*D.*	Parts.	*S.*	*D.*	Parts.
10	6	2	2	4	9
7	0	3	1	9	12
5	3	4	1	6	14
3	6	6	1	3¾	16
3	0	7	1	2	18
2	7½	8	0	10½	24

The enlarged Multiplication Table.

This table is to be got off in the ſame manner as the common one, which is inſerted in moſt books of arithmetic.

For inſtance, 7 times 16. In a direct line with 7, and under 16 is 112.

The enlarged Pence Table.

It will be eaſy enough, by a little practice, to expreſs inſtantly the value of any intermediate number to thoſe in the table, as well as thoſe actually inſerted in it; at leaſt, as high as one pound.

For inſtance, as 160*d.* is 13*s.* 4*d.* it will immediately occur that 162*d.* is 13*s.* 6*d.*

Again, as 228*d.* is 19*s.* it is inſtantly known that 227*d.* is 18*s.* 11*d.*

Aliquot Parts of a Guinea.

This table is to be read in the ſame manner as the table of the aliquot parts of a pound in common practice. Thus 10*s.* 6*d.* is contained twice in a guinea; 2*s.* 4*d.* is nine times in a guinea, &c.

Beſides a moſt ready and perfect knowledge of theſe tables, off the book, the ſtudent muſt be very expert at dividing two or three figures, by any number under 20.

Half-pence are reduced into pence, by dividing by 2; farthings into pence, by dividing by 4. Hence, by an eaſy mental diviſion, the value of any number of half-pence, or any number of farthings.

Thus 220 half-pence is 110*d.*=9*s.* 2*d.*
And 272 farthings=68*d.*=5*s.* 8*d.*

⁂

SECTION II.

When the Quantity is any Number under 21, *and the Price any Number of Pence under* 11;

Or when the Quantity is any Number under 11, *and the Price any Number under* 21.

RULE.

BY knowing the enlarged table, the product of the quantity and price is inſtantly known; and, by the pence table, the ſhillings in that product are alſo inſtantly known.

EXAMPLE 1.

Required the value of 14 yards at 10*d.* per yard?

One who has the tables perfectly off will inſtantly know that 14×10=140*d.* and that 140*d.*=11*s.* 8*d.*

EXAMPLE 2.

Required the value of 15 yards at 8*d.* per yard?—It is inſtantly known that 15×8*d.* =120*d.*=10*s.*

EXAMPLE 3.

Required the value of 19 yards at 8*d.* per yard?—Although 152*d.* which is inſtantly known to be the product of 19×8, is not in the pence table; yet one who knows that 150*d.* is 12*s.* 6*d.* will immediately ſay that 152*d.* is 12*s.* 8*d.*

MORE EXAMPLES.

	d.	d.	s.	d.
13 yards at	4=	52=	4	4.
13 yards at	9=	117=	9	9.
14 yards at	3=	42=	3	6.
14 yards at	8=	112=	9	4.
15 yards at	2=	30=	2	6.
15 yards at	9=	135=	11	3.
16 yards at	4=	64=	5	4.
16 yards at	9=	144=	12	0.
17 yards at	7=	119=	9	11.
18 yards at	8=	144=	12	0.

	d.	d.	s.	d.
19 yards at	5=	95=	7	11.
4 yards at	17=	68=	5	8.
4 yards at	19=	76=	6	4.
5 yards at	16=	80=	6	8.
5 yards at	17=	85=	7	1.
7 yards at	18=	126=	10	6.
7 yards at	19=	133=	11	1.
8 yards at	17=	136=	11	4.
8 yards at	20=	160=	13	4.
9 yards at	14=	126=	10	6.
9 yards at	19=	171=	14	3.
10 yards at	15=	150=	12	6.
10 yards at	19=	190=	15	10.

If the price conſiſts of pence, and one farthing, add ¼ of the quantity to the other value. If there be a remainder, it is farthings. When the price is pence and a half-penny, add ½ of the quantity to the other value.

EXAMPLES.

	d.	*s.*	*d.*	*d.*	*s.*	*d.*
16 yards at	2¼ =	2	8	+ 4 =	3	0.
17 yards at	3¼ =	4	3	+ 4¼ =	4	7¼.
18 yards at	4¼ =	6	0	+ 4½ =	6	4½.
7¼ yds. at	16 =	9	4	+ 4 =	9	8.
14 yards at	7½ =	8	2	+ 7 =	8	9.
17 yards at	9½ =	12	9	+ 8½ =	13	5½.
10½ yds. at	15 =	12	6	+ 7½ =	13	1½.

When the price is pence and three farthings, call the price one farthing more. Find the value with this aſſumed price, and ſubtract one-fourth of the quantity, as pence, from the other value.

EXAMPLE I.

Required the value of 16 yards at 7¾*d.* per yard?

Call the price 8*d.* Then 16×8=128 =10*s.* 8*d.* from which ſubtract one-fourth of 16, viz. 4; and the anſwer is, 10*s.* 4*d.*

EXAMPLE 2.

Required the value of 14 yards at 8¾*d.* per yard?

If the price be called 9*d.* it will be 14 ×9=10*s.* 6*d.* and 14÷4=3½*d.* therefore the anſwer is 10*s.* 2½*d.*

MORE EXAMPLES.

	d.		*s.*	*d.*
18 yards at	2¾	=	4	1½.
4 yards at	17¾	=	5	11.
8 yards at	14¾	=	9	10.

SEC-

SECTION III.

When the Quantity is any Number under 20, *and the Price any Number of Shillings under* 13:

Or when the Quantity is any Number under 13, *and the Price any Number of Shillings under* 20.

RULE.

THE figure, in the units place of their product, conſider as ſhillings. Half the other part of the product is pounds. If 1 remains, add 10*s.* to the figure in the units place.

EXAMPLE 1.

Required the value of 16 yards at 8*s.*?

The product is 128. One half of 12 is 6; therefore the anſwer is 6*l.* 8*s.*

EXAMPLE 2.

Required the value of 18 yards at 12*s.*?

Their product is 216. One half of 21 is 10: the remaining 1, joined to the laſt figure 6, makes 16*s.* therefore the value is 10*l.* 16*s.*

MORE EXAMPLES.

	s.	s.	l.	s.
13 yards at	8=	104=	5	4.
14 yards at	7=	98=	4	18.
15 yards at	9=	135=	6	15.
16 yards at	12=	192=	9	12.
17 yards at	10=	170=	8	10.
18 yards at	11=	198=	9	18.
7 yards at	17=	119=	5	19.
9 yards at	18=	162=	8	2.
11 yards at	13=	143=	7	3.
12 yards at	17=	204=	10	4.

If, beſides a number of ſhillings, the price contains pence—add $\frac{1}{2}$ of the quantity to the value for the ſhillings, for 6*d.* Add $\frac{1}{3}$ of the quantity for 4*d.* &c.

EXAMPLE 1.

Required the value of 16 yards at 11*s.* 6*d.*?

The value of 16 yards at 11*s.* is 8*l.* 16*s.* to which $\frac{1}{2}$ of 16 being added, the whole is 17*l.* 4*s.*

EXAMPLE 2.

Required the value of 18 yards at 4*s.* 2*d.*?

The value of 18 yards at 4*s.* is 3*l.* 12*s.* to which, $\frac{1}{6}$ of 18 being added, the anſwer is 3*l.* 15*s.*

MORE EXAMPLES.

	s.	d.		s.		s.		l.	d.
14 yards at	4	6	=	56	+	7	=	3	3.
16 yards at	8	3	=	128	+	4	=	6	12.
15 yards at	9	4	=	135	+	5	=	7	0.
8 yards at	14	1½	=	112	+	1	=	5	13.
6 yards at	15	2	=	90	+	1	=	4	11.

But it is generally the beſt way, when the price conſiſts of ſhillings and pence, to find the value for the ſhillings by this Section; the value for the pence by Section II. and adding them.

EXAMPLE I.

Required the value of 16 yards at 4*s.* 7*d.*?

16 at 4*s.* come to 3*l.* 4*s.* and 16 yards at 7*d.* come to 9*s.* 4*d.* therefore the anſwer is 3*l.* 13*s.* 4*d.*

MORE EXAMPLES.

yds.		*s.*	*d.*		*l.*	*s.*		*s.*	*d.*		*l.*	*s.*	*d.*
14	at	8	5	=	5	12	+	5	10	=	5	17	10.
17	at	12	3	=	10	4	+	4	3	=	10	8	3.
18	at	5	2½	=	4	10	+	3	9	=	4	13	9.

When

When the price is within 1*d.* or 2*d.* of ſhillings, find the value for the neareſt ſhillings, and ſubtract for the difference.

EXAMPLE 1.

Required the value of 16 yards at 5*s.* 11*d.*?

16 yards at 6*s.* come to 4*l.* 16*s.* from which 1*s.* 4*d.* being taken, the remainder is 4*l.* 14*s.* 8*d.*

EXAMPLE 2.

Required the value of 18 yards at 8*s.* 11½*d.*?

18 yards at 9*s.* come to 8*l.* 2*s.* from which 9*d.* being taken, the remainder is 8*l.* 1*s.* 3*d.*

MORE EXAMPLES.

	s.	*d.*	*l.*	*s.*	*s.*	*d.*	*l.*	*s.*	*d.*
10 yards at	15	10 =	8	0 —	1	8 =	7	18	4.
13 yards at	11	11 =	7	16 —	1	1 =	7	14	11.
15 yards at	2	10 =	2	5 —	2	6 =	2	2	6.

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SECTION IV.

When the Price is near to one Pound.

RULE.

LET the quantity ſtand for the anſwer in pounds; and add or ſubtract for the value of the exceſs or defect.

EXAMPLE I.

Required the value of 67 yards at 1*l.* 0*s.* 1*d.*?

67 yards at 1*l.* come to 67*l.* and 67 at 1*d.* come to 5*s.* 7*d.* therefore the anſwer is 67*l.* 5*s.* 7*d.*

EXAMPLE 2.

Required the value of 72 yards at 19*s.* 11¾*d.*

72 yards at 1*l.* come to 72*l.* But that is 1 farthing too much per yard; therefore 72 farthings = 1*s.* 6*d.* muſt be deducted: hence the anſwer is 71*l.* 18*s.* 6*d.*

MORE EXAMPLES.

	l.	*s.*	*d.*		*d.*	*s.*	*d.*
324 yards at	1	0	6	=	332	10	0.
56 yards at	1	0	0½	=	56	2	4.
92 yards at	1	0	0¼	=	92	1	11.
160 yards at	1	0	2	=	161	6	8.
240 yards at	1	0	3	=	243	0	0.

SEC-

SECTION V.

To find the Value of any Quantity of Goods, when the Price is nearly an aliquot Part of a Pound.

RULE.

FIND the value for the aliquot part, by the common rule of practice. The value of the difference between the two prices will be known by Pence Table. To be added, to the value already found, if the price be greater than the aliquot one; but ſubtracted when leſſer.

EXAMPLE 1.

Required the value of 216 yards at 10*s.* 1*d.* per yard?

It is eaſy to divide 216 mentally by 2, which gives 108*l.* and, at the ſame inſtant, to know that 216*d.* make 18*s.* and that therefore 216 yards at 10*s.* 1*d.* come to 108*l.* 18*s.*

EXAMPLE 2.

Required the value of 228 yards at 6*s.* 9*d.*?

228÷3=76*l.* and 228*d.*=19*s.* therefore the anſwer is 76*l.* 19*s.*

EXAMPLE 3.

Required the value of 400 yards at 5*s.* 1*d.*?

400÷4=100*l.* and 400*d.*=1*l.* 13*s.* 4*d.* therefore the anſwer is 101*l.* 13*s.* 4*d.*

EXAMPLE 4.

Required the value of 300 yards at 4*s.* 0½*d.*?

300÷5=60*l.* and 300 at ½*d.*=150*d.*= 12*s.* 6*d.* therefore the anſwer is 60*l.* 12*s.* 6*d.*

EXAMPLE 5.

Required the value of 136 yards at 3*s.* 4¼*d.*?

136÷6=22*l.* 13*s.* 4*d.* and 136*qrs.*=34*d.* =2*s.* 10*d.* therefore the anſwer is 22*l.* 16*s.* 2*d.*

EXAMPLE 6.

Required the value of 57 yards at 2*l.* 7*s.*?

57÷8=7*l.* 2*s.* 6*d.* and 57*d.*=4*s.* 9*d.* therefore the anſwer is 7*l.* 7*s.* 3*d.*

EXAMPLE 7.

Required the value of 34 yards at 2*s.* 0½*d.*?

34÷10=3*l.* 8*s.* and 34 at ½*d.*=17*d.*= 1*s.* 5*d.* therefore the anſwer is 3*l.* 9*s.* 5*d.*

EXAMPLE 8.

Required the value of 84 yards at 1*s.* 8½*d.*?

84÷12=7*l.* and 84 at ½*d.*=42*d.*=3*s.* 6*d.* therefore the anſwer is 7*l.* 3*s.* 6*d.*

EXAMPLE 9.

Required the value of 429 yards at 1*s.* 1*d.*?

429÷20=21*l.* 9*s.* and 429 at 1*d.*=1*l.* 15*s.* 9*d.* hence the anſwer is 23*l.* 4*s.* 9*d.*

EXAMPLE 10.

Required the value of 260 yards at 9*s.* 11*d.* per yard?

260÷2=130*l.* and 260 at 1*d.*=1*l.* 1*s.* 8*d.* which taken from 130*l.* leaves 128*l.* 18*s.* 4*d.* for the anſwer.

EXAMPLE 11.

Required the value of 384 yards at 6*s.* 7½*d.*?

384÷3=128*l.* and 384 at ½*d.*=192*d.*=16*s.* which taken from 128*l.* leaves 127*l.* 4*s.* for the anſwer.

EXAMPLE 12.

Required the value of 64 yards at 5*s.* 2*d.*?

64÷4=16, and twice 5*s.* 4*d.* is 10*s.* 8*d.* therefore the anſwer is 16*l.* 10*s.* 8*d.*

EXAMPLE 13.

Required the value of 360 yards at 2*s.* 2*d.*?

360÷10=36*l.* and twice 1*l.* 10*s.*=3*l.* therefore the anſwer is 39*l.*

MORE EXAMPLES.

	s.	*d.*		*l.*	*s.*	*d.*
88 yards at	10	0¼	=	44	1	10.
74 yards at	6	7¾	=	24	11	9½.
204 yards at	5	0¼	=	51	4	3.

SECTION VI.

When the Price is an aliquot Part of a Guinea.

RULE.

DIVIDE the quantity by the aliquot part, and the diviſor is the anſwer in guineas, which is moſt readily turned into pounds. When there is a remainder, multiply it into the price.

EXAMPLE I.

Required the value of 128 yards at 10*s.* 6*d.*?

128÷2=64 guineas=67*l.* 4*s.* the anſwer.

EXAMPLE 2.

Required the value of 147 gallons at 7*s.*?

147÷3=49 guineas=51*l.* 9*s.* the anſwer.

MORE EXAMPLES.

yds.		*s.*	*d.*		*l.*	*s.*	*d.*
48	at	5	3	=12 guineas	=12	12	0.
76	at	3	6	=12 gs. and 14*s.*	=13	6	0.
154	at	3	0	=22 guineas	=23	2	0.

yds.		*s.*	*d.*		*l.*	*s.*	*d.*
424	at	2	7½	=53 guineas	=55	13	0.
172	at	2	4	=19 guins. 2*s.* 4*d.*	=20	1	4.
196	at	1	9	=16 guineas, 7*s.*	=17	3	0.

EXAMPLES, *when the Price is only nearly an aliquot Part of a Guinea.*

EXAMPLE I.

Required the value of 26 yards at 10*s.* 7*d.* per yard?

26÷2=13 guineas, to which 26*d.* being added, the anſwer is 13*l.* 15*s.* 2*d.*

MORE EXAMPLES.

	s.	*d.*		*gs.*		*s.*	*d.*		*l.*	*s.*	*d.*
39 yds. at	6	11	=	13	−	3	3	=	13	9	9.
16 yds. at	5	2	=	4	−	1	4	=	4	2	8.
36 yds. at	3	6½	=	6	+	1	6	=	6	7	6.
56 yds. at	2	11	=	8	−	4	8	=	8	3	4.
24 yds. at	2	8½	=	3	+	2	0	=	3	5	0.
27 yds. at	2	3½	=	3	−	1	1½	=	3	1	10½.
48 yds. at	1	9½	=	4	+	2	0	=	4	6	0.

SECTION VII.

When the Price is nearly One Shilling.

RULE.

LET the quantity ſtand for the anſwer in pence; and add or ſubtract for the difference.

EXAMPLE I.

Required the value of 36 yards at 1*s.* 1*d.*?

36 yards at 1*s.* is 1*l.* 16*s.* to which add 36*d.*=3*s.* being added, the amount is 1*l.* 19*s.*

MORE EXAMPLES.

yds.		s.	d.		l.	s.		s.	d.		l.	s.	d.
48	at	1	1	=	2	8	+	4	0	=	2	12	0.
32	at	1	0½	=	1	12	+	1	4	=	1	13	4.
40	at	1	2	=	2	0	+	6	8	=	2	6	8.
126	at	1	1	=	6	6	+	10	6	=	6	16	6.
19	at	1	0½	=	0	19	+	0	9½	=	0	19	9½.
210	at	0	11	=	10	10	—	17	6	=	9	12	6.
424	at	0	11½	=	21	4	—	17	8	=	20	6	4.
138	at	0	11¾	=	6	18	—	2	10½	=	6	15	1½.
14	at	0	10	=	0	14	—	2	4	=	0	11	8.
92	at	0	10	=	4	12	—	15	4	=	3	16	8.

SEC-

SECTION VIII.

When the Quantity is 12.

RULE.

THE anſwer will be as many ſhillings, as the price conſiſts of pence. If 24, twice as many; if 36, thrice as many, &c.

EXAMPLES.

	s.	*d.*		*s.*	*d.*		*l.*	*s.*	*d.*
12 yards at	6	4	=	76		=	3	16	0.
12 yards at	14	3	=	171		=	8	11	0.
12 yards at	8	4½	=	100	6	=	5	0	6.

24 yards

	s.	d.		d.		l.	s.	d.
24 yards at	3	9	=	45	× 2=	4	10	0.
24 yards at	11	2	=	134	× 2=	13	8	0.
24 yards at	4	1½	=	49½	× 2=	4	19	0.
36 yards at	2	4	=	28	× 3=	4	4	0.
36 yards at	7	6	=	90	× 3=	13	10	0.
36 yards at	4	2½	=	50½	× 3=	7	11	6.
132 yards at	6	7	=	79	×11=	43	9	0.
132 yards at	2	8	=	32	×11=	17	12	0.
144 yards at	4	3	=	51	×12=	30	12	0.
144 yards at	7	4	=	88	×12=	52	16	0.
144 yards at	2	3	=	27	×12=	16	4	0.

If the number of yards be not exactly a multiple of 12, find the value of the neareſt number that is a multiple of 12; and add or ſubtract for the value of the difference.

EXAMPLE I.

Required the value of 122 yards at 3*s.* 1*d.*?

In this Example, 120 is the neareſt; therefore 37×10=18*l.* 10*s.* and 2 yards are 6*s.* 2*d.* hence 18*l.* 16*s.* 2*d.* is the anſwer.

MORE EXAMPLES.

yds.	*s.*	*d.*	*l.*	*s.*	*s.*	*d.*	*l.*	*s.*	*d.*
50 at	2	3=	1	7×4,	+4	6=	5	12	6.
61 at	1	7=	0	19×5,	+1	7=	4	16	7.
25 at	2	10=	1	14×2,	+2	10=	3	10	10.
49 at	4	6=	2	14×4,	+4	6=	11	0	6.
59 at	6	6=	3	18×5,	−6	4=	19	3	8.
74 at	2	7=	1	11×6,	+5	2=	9	11	2.
85 at	5	10=	3	10×7,	+5	10=	24	15	10.
143 at	1	9=	1	1×12	−1	9=	12	10	3.

SECTION IX.

When the Quantity is 20.

RULE.

THE ſhillings of the price is the anſwer in pounds. If there be 6*d.* in the price, beſides the ſhillings, add 10*s.* and, if 3*d.* add 5. But, if there be any other number of pence, multiply by 20, and the knowledge of the Pence Table will inſtantly determine the value.

EXAMPLES.

	s.	d.		l.	s.	d.		l.	s.	d.		l.	s.	d.
20 at	4	6	=	4	10	0.								
20 at	7	3	=	7	5	0.								
20 at	3	5	=	3	8	4.								
20 at	12	7	=	12	11	8.								
23 at	9	2	=	9	3	4	+	1	7	6	=	10	10	10.
21 at	8	4	=	8	6	8	+	0	8	4	=	8	15	0.

If the quantity be 40, 60, 80, &c. multiply the value of 20 by 2, 3, 4, &c.

EXAMPLES.

yds. *s.* *d.* *l.* *s.* *d.* *l.* *s.* *d.*

40 at 6 4= 6 6 8×2=12 13 4.

40 at 7 10= 7 16 8×2=15 13 4.

60 at 5 6= 5 10 0×3=16 10 0.

80 at 7 2= 7 3 4×4=28 13 4.

100 at 14 6=14 10 0×5=72 10 0.

120 at 9 2= 9 3 4×6=55 0 0.

* * *

SEC-

SECTION X.

When the Value of a Quantity of Goods, at a given Price, is known; the Value of two, three, or four times the Quantity is found by multiplying the known Value by 2, 3, 4, *&c.*

Or when the Value of a Quantity, at a given Price, is known; the Value of the ſame Quantity at two, three, or four times the Price is found by multiplying the known Value by 2, 3, 4, *&c,*

EXAMPLE I.

A Linen-draper, making out his bill, has 18 yards of cotton at 2*s.* 4*d.* per yard, in in it; which, while he is writing the line, he mentally knows to be 2*l.* In another line he has 72 yards of linen at 2*s.* 4*d.* whoſe value he immediately knows to be 8*s.* For 72÷18=4, and 4×2=8*l.*

EXAMPLE 2.

One article being 11 yards, at 4*s.* 4*d.* the value is 2*l.* 7*s.* 8*d.* hence the value of 88 yards, at 4*s.* 4*d.* is readily found to be 19*l.* 1*s.* 4*d.*

EXAMPLE 3.

The value of 14 yards, at 2*s.* 3*d.* is 1*l.* 11*s.* 6*d.* Hence 14 yards, at 6*s.* 9*d.* come to 4*l.* 14*s.* 6*d.*

EXAMPLE 4.

The value of 22 yards, at 4*s.* 1*d.* is 4*l.* 9*s.* 10*d.* hence 22 yards, at 16*s.* 4*d.* come to 17*l.* 19*s.* 4*d.*

EXAMPLE 5.

The value of 8 yards, at 10*s.* 3*d.* is 4*l.* 2*s.* hence 42 yards, at 10*s.* 3*d.* come to 21*l.* 10*s.* 6*d.* For 40 yards, viz. 8×5, come to 20*l.* 10s. to which 1*l.* 0*s.* 6*d.* the value of 2 yards, being added, the anſwer is 21*l.* 10*s.* 6*d.*

* * *

SEC-

SECTION XI.

Contractions in Loſs and Gain.

RULE.

IF the proportion between the prime coſt and the gain is expreſſed by a whole number, divide 100*l.* by that number; the quotient will be the gain *per cent.*

EXAMPLE I.

When wine is bought at 7*s.* 6*d.* per gallon, and ſold for 10*s.* how much is the gain *per cent.*?

The

The prime coſt, in this example, is three times the gain; therefore 100÷3= 33*l.* 6*s.* 8*d.* gain *per cent.*

EXAMPLE 2.

When tea is bought at 6*s.* 8*d.* per lb. and ſold at 7*s.* 4*d.* the prime coſt is ten times the gain, hence 100*l.*÷10=10*l.* the gain *per cent.*

EXAMPLE 3.

If cotton be bought at 2*s.* 6*d.* per yard, and ſold at 2*s.* 8*d.* the prime coſt is 15 times the gain; therefore 100÷15=6*l.* 13*s.* 4*d.*

When

When the gain *per cent.* is determined on, and the ſelling price wanted, increaſe the prime coſt by ſuch a part of itſelf, as gain is of 100*l.*

EXAMPLE I.

Bought muſlin at 4*s.* 8*d.* per yard: how muſt it be ſold to gain 12½*l.* *per cent.*?

In 100*l.* the gain 12*l.* 10*s.* is contained 8 times, ∴ to 4*s.* 8*d.* add one-eighth of itſelf, viz. 7*d.* and the ſelling price will be 5*s.* 3*d.*

EXAMPLE 2.

Bought cheeſe at 2*s.* 4*d.* per hundred weight :—How muſt it be ſold to gain 6*l.* 5*s. per cent.*?

The proportion is 16, and 2*l.* 4*s.*÷16= 2*s.* 9*d.* Hence the ſelling price muſt be 2*l.* 6*s.* 9*d.*

The following Table contains all the aliquot Parts of 100*l. from the One-Third to the Twentieth, and, when committed to Memory, will immediately ſolve any Queſtion in Loſs and Gain.*

TABLE

L.	*S.*	*D.*	Part.
33	6	8	3
25	0	0	4
20	0	0	5
16	13	4	6
12	10	0	8
10	0	0	10
8	6	8	12
6	13	4	15
6	5	0	16
5	0	0	20

The application of the Table is obvious. If the prime coſt is 6 times the gain; then the gain *per cent.* is 16*l.* 13*s.* 4*d.*

On the other hand, if the gain *per cent.* be fixed at 5*l.* then the prime coſt muſt be increaſed by one-twentieth of itſelf.

SECTION XII.

Contractions in Proportion.

WHEN the firſt and third terms, or the firſt and ſecond terms, are both diviſible by the ſame number, it ſhortens the operation much, when that diviſion is actually made.

EXAMPLE I.

When 66 yards coſt 45*l.* how much will 55 yards come to?

The firſt and third terms are diviſible by 11—Therefore 6..45::5..37*l.* 10*s.* the anſwer.

EXAMPLE 2.

When 24 yards coſt 15*l.* how much will 84 yards come to?

The firſt and third terms are diviſible by 12—Therefore, as 2..15*l.*::7..52*l.* 10*s.*

EXAMPLE 3.

When 64 yards coſt 48*l.* how much will 51 yards coſt?

The firſt and ſecond are diviſible by 16—Therefore 4..3::51..38*l.* 5*s.*

EXAMPLE 4.

When 45 yards coſt 15*l.* how much will 96 yards come to?

The firſt and ſecond are diviſible by 15 —Therefore 3..1::96..32. Or 96÷3= 32*l.*

EXAMPLE 5.

When 204 yards come to 119*l.* how much will 7 yards come to?

The two firſt numbers are diviſible by 17 —Therefore 12..7::7..4*l.* 1*s.* 8*d.*

* * *

SECTION XIII.

Occaſional Exerciſes.

AMONGST the following Examples, there are ſeveral which are not ſimilar to any in the preceding Sections. Such as thoſe where the quantity is 240, 242, 480, 483, 252, &c. It is neceſſary to obſerve, therefore, that when the quantity is 240, the anſwer is as many pounds, as the price conſiſts of pence. When the quantity is 252, the anſwer will be as many guineas, as there are pence in the price.

The firſt eight of the Examples following correſpond reſpectively with the ſecond and ſeven following Sections. Afterwards they are given promiſcuouſly. The Scholar muſt, from the attention he has given, adopt the moſt proper rules.

EXAMPLES.

	s.	*d.*		*l.*	*s.*	*d.*
18 yards at	0	9	=	0	13	6.
13 yards at	7	0	=	4	11	0.
140 yards at	19	$11\frac{1}{2}$	=	139	14	2.
340 yards at	3	$11\frac{3}{4}$	=	67	12	11.
288 yards at	3	6	=	50	8	0.
160 yards at	1	1	=	8	13	4.
12 yards at	13	10	=	8	6	0.
20 yards at	7	6	=	7	10	0.

48 yards

	s.	d.		l.	s.	d.
48 yards at	3	5	=	10	12	0.
62 yards at	4	8	=	14	9	4.
32 yards at	2	7½	=	4	4	0.
84 yards at	13	1	=	54	17	0.
12 yards at	7	2	=	4	6	0.
240 yards at	5	10	=	70	6	0.
240 yards at	4	3	=	51	0	0.
480 yards at	8	4	=	200	0	0.
242 yards at	2	3	=	27	4	6.
244 yards at	4	4	=	52	17	4.
252 yards at	2	1	=	28	7	0.
252 yards at	0	8	=	8	8	0.

	s.	d.		l.	s.	d.
504 yards at	0	5	=	10	10	0;
504 yards at	2	2	=	54	12	0;
16 yards at	0	3¼	=	0	4	4.
160 yards at	0	3¼	=	2	3	4.
25 yards at	10	2	=	12	14	2.
112 yards at	19	6	=	109	4	0.
63 yards at	10	6	=	33	1	6.
40 yards at	14	0	=	28	0	0.
320 yards at	19	11½	=	319	6	8.
71 yards at	5	4	=	18	18	4.
239 yards at	4	1	=	48	15	11.
51 yards at	6	7	=	16	15	9.
88 yards at	5	0½	=	22	3	8.

	l.	d.		l.	s.	d.
17 yards at	0	2	=	0	2	10.
13 yards at	0	8	=	0	8	8.
24 yards at	1	2	=	1	8	0.
66 yards at	3	6	=	11	11	0.
56 yards at	5	2¾	=	14	12	10.
14 yards at	4	5	=	3	1	10.
28 yards at	4	5	=	6	3	8.
28 yards at	8	10	=	12	7	4.
15 yards at	3	7	=	2	13	9.
210 yards at	0	2	=	1	15	0.
108 yards at	5	0¼	=	27	2	3.
200 yards at	2	1	=	20	16	8.

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